WHAT IS CLAIMED IS:

1. A ridge waveguide semiconductor laser diode comprising:

a semiconductor substrate,

a front facet and a back facet;

at least one active layer disposed over said semiconductor substrate and disposed between said front and back facets, said at least one active layer having a surface, and

at least one cladding layer disposed over said at least one active layer and disposed between said front and back facets and having a ridge structure part and an underlying remaining part, said remaining part overlying said at least one active layer and having a thickness D, and

wherein the laser diode emits a beam of light from its front facet when operated, the beam having a maximum power level substantially at its center and a peripheral edge where the power level of the beam is a fraction $1/e^2$ of the maximum power level, wherein "e" is the base of the natural logarithm, the peripheral edge of the beam having a vertical width W as measured at the front facet and in a direction which is perpendicular to the surface of the at least one active layer, and

wherein said thickness D is greater than or equal to $0.5 \times W$.

2. The ridge waveguide semiconductor laser diode of Claim 1 further comprising a length between the front and back facets which is not less than 1 mm.

3. The ridge waveguide semiconductor laser diode of Claim 2 further comprising a length between the front and back facets, and wherein the ridge structure part comprises a ridge width perpendicular to the length, and wherein the ridge width is tapered along the length toward the back facet for at least a portion of the length.

4. The ridge waveguide semiconductor laser diode of Claim 2 further comprising a metal layer disposed over the ridge structure part for coupling a current to the ridge, said metal layer having a thickness of more than 0.6 μm.

5. The ridge waveguide semiconductor laser diode of Claim 4 wherein the metal layer comprises a first sub-layer of titanium, a second sub-layer of platinum, and a third sub-layer of gold.

6. The ridge waveguide semiconductor laser diode of Claim 4 wherein the metal layer has a thickness of approximately 1.5 μm.

7. The ridge waveguide semiconductor laser diode of Claim 1 further comprising a passivation layer disposed on at least one of the front and back facets, said passivation layer comprising a material that is substantially oxygen free.

8. The ridge waveguide semiconductor laser diode of Claim 7 wherein the passivation layer material comprises at least one of silicon, germanium, and antimony as a constituent element.

9. The ridge waveguide semiconductor laser diode of Claim 7 further comprising a length between the front and back facets which is not less than 1 mm.

10. The ridge waveguide semiconductor laser diode of Claim 7 further comprising a length between the front and back facets, and wherein the ridge structure part comprises a ridge width perpendicular to the length, and wherein the ridge width is tapered along the length toward the back facet for at least a portion of the length.

11. The ridge waveguide semiconductor laser diode of Claim 7 further comprising a metal layer disposed over the ridge structure part for coupling a current to the ridge, said metal layer having a thickness of more than 0.6 μm.

12. The ridge waveguide semiconductor laser diode of Claim 11 wherein the metal layer comprises a first sub-layer of titanium, a second sub-layer of platinum, and a third sub-layer of gold.

13. The ridge waveguide semiconductor laser diode of Claim 11 wherein the metal layer has a thickness of approximately 1.5 μm.

14. The ridge waveguide semiconductor laser diode of Claim 1 wherein the ridge structure part has a ridge width of at least 4 μm.

15. The ridge waveguide semiconductor laser diode of Claim 14 further comprising a passivation layer disposed on at least one of the front and back facets, said passivation layer comprising at least one of silicon, germanium, and antimony as a constituent element.

16. The ridge waveguide semiconductor laser diode of Claim 14 further comprising a length between the front and back facets which is not less than 1 mm.

17. The ridge waveguide semiconductor laser diode of Claim 14 further comprising a length between the front and back facets, and wherein the ridge structure part comprises a ridge width perpendicular to the length, and wherein the ridge width is tapered along the length toward the back facet for at least a portion of the length.

18. The ridge waveguide semiconductor laser diode of Claim 14 further comprising a metal layer disposed over the ridge structure part for coupling a current to the ridge, said metal layer having a thickness of more than 0.6 μm.

19. The ridge waveguide semiconductor laser diode of Claim 18 wherein the metal layer comprises evaporated gold material.

20. The ridge waveguide semiconductor laser diode of Claim 18 wherein the metal layer comprises a first sub-layer of titanium, a second sub-layer of platinum, and a third sub-layer of gold.

21. The ridge waveguide semiconductor laser diode of Claim 18 wherein the metal layer has a thickness of approximately 1.5 μm.

22. The ridge waveguide semiconductor laser diode of Claim 1 wherein the ridge waveguide semiconductor laser diode has an oscillation wavelength in the range of 700 nm to 1550 nm.

23. The ridge waveguide semiconductor laser diode of Claim 22 wherein the ridge waveguide semiconductor laser diode has an oscillation wavelength in the range of 1300 nm to 1550 nm.